Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

On a Point of the Theory of Functions.

By A. S. Chessin.

The question whether a non-uniformly convergent series may represent a continuous function has been answered in an affirmative way, first by P. Du Bois-Reymond, then by Darboux[*] and G. Cantor.[†] But all the examples of continuous functions defined by non-uniformly convergent series to my knowledge given heretofore were of the form

$$F(x) = \sum_{1}^{\infty}{}^{m}\, \theta(x) f_m(x). \tag{1}$$

Moreover, the point in the neighborhood of which this series became non-uniformly convergent was invariably a root of the equation $\theta(x) = 0$. For such series the following general proposition may be enunciated:

If the convergence of the series (1) *be non-uniform in the neighborhood of a point* x_0 *which is a root of the equation* $\theta(x) = 0$, *and if the value of the non-uniformly convergent series* $\sum_{1}^{\infty}{}^{m} f_m(x)$ *remains finite in the neighborhood of the point* x_0 *whatever value it may have for* $x = x_0$, *then* $F(x)$ *is continuous at this point. If, on the contrary, the value of the series* $\sum_{1}^{\infty}{}^{m} f_m(x)$ *tends to become infinite as* x *approaches the value* x_0, *then* $F(x)$ *is discontinuous at this point.*

But when $\theta(x)$ is a constant, or when x_0 is not a root of the equation $\theta(x) = 0$, the question whether a continuous function may be defined by a non-uniformly convergent series still remains unanswered.

---

[*] Mém. sur les fonctions discontinues. Ann. de l'École Normale Sup., 2e série, t. IV.

[†] Math. Annalen, XVI, p. 269. The author acknowledges that the priority in the matter belongs to P. Du Bois-Reymond.